Exhibit X

Exhibit A-16

Invalidity of U.S. Patent No. 6,757,068 ("'068 Patent")[1] under Pre-AIA Section 102 or Section 103 in view of InterSense IS-600 or InterSense IS-600 Mark 2 Plus (collectively, "InterSense IS-600")[2]

InterSense IS-600 was publicly available at least as of 1996. Plaintiffs assert a priority date of January 28, 2000 for the '068 Patent. Even assuming that the '068 Patent is entitled to this priority date, InterSense IS-600 qualifies as prior art under at least pre-AIA Sections 102(a) and (b) to the '068 Patent.

As described herein, the asserted claims of the '068 Patent are invalid (a) under one or more sections of 35 U.S.C. § 102 as anticipated expressly or inherently by InterSense IS-600 (including the documents incorporated into InterSense IS-600 by reference) and (b) under 35 U.S.C. § 103 as obvious in view of InterSense IS-600 standing alone and, additionally, in combination with the knowledge of one of ordinary skill in the art, and/or other prior art, including but not limited to the prior art identified in Defendants' Invalidity Contentions and the prior art described in the claim charts attached in Exhibits A-1 – A-29. With respect to the proposed modifications to InterSense IS-600, as of the priority date of the '068 Patent, such modification would have been obvious to try, an obvious combination of prior art elements according to known methods to yield predictable results, a simple substitution of one known element for another to obtain predictable results, a use of known techniques to improve a similar devices or method in the same way, an application of a known technique to a known device or method ready for improvement to yield predictable results, a variation of a known work in one field of endeavor for use in either the same field or a different one based on design incentives or other market forces with variations that are predictable to one of ordinary skill in the art, and/or obvious in view of teachings, suggestions, and motivations in the prior art that would have led one of ordinary skill to modify or combine the prior art references.

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[1] Discovery in this case is ongoing and, accordingly, this invalidity chart is not to be considered final. Defendants have conducted the invalidity analysis herein without having fully undergone claim construction and a *Markman* hearing. By charting the prior art against the claim(s) herein, Defendants are not admitting nor agreeing to Plaintiffs' interpretation of the claims at issue in this case. Additionally, these charts provide representative examples of portions of the charted references that disclose the indicated limitations under Plaintiffs' application of the claims; additional portions of these references other than the representative examples provided herein may also disclose the indicated limitation(s) and Defendants contend that the asserted claim(s) are invalid in light of the charted reference(s) as a whole. Defendants reserve the right to rely on additional citations or sources of evidence that also may be applicable, or that may become applicable in light of claim construction, changes in Plaintiffs' infringement contentions, and/or information obtained during discovery as the case progresses. Further, by submitting these invalidity contentions, Defendants do not waive and hereby expressly reserve their right to raise other invalidity defenses, including but not limited to defenses under Sections 101 and 112. Defendants reserve the right to amend or supplement this claim chart at a later date, including after the Court's order construing disputed claim terms.

[2] The claim limitations described herein were disclosed by InterSense IS-600 as of the earliest priority date of the '068 patent. For instance: IS-600 Mark 2 Precision Motion Trackers, INTERSENSE INC., https://www.udc.es/citeec/documentos/posicion3d.pdf ("Intersense IS-600 Ex. 1"); User Manual for IS-600 Mark 2 Plus Systems Firmware versions 3.1 and above, INTERSENSE INC. (2000), https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.478.1635&rep=rep1&type=pdf ("Intersense IS-600 Ex. 2"); and IS-600 Mark 2 Precision Motion Tracker (May 20, 2003), https://web.archive.org/web/20030520214925/http://intersense.com/products/prec/is600/ ("Intersense IS-600 Ex. 3").

All cross-references should be understood to include material that is cross-referenced within the cross-reference. Where a particular figure is cited, the citation should be understood to encompass the caption and description of the figure as well as any text relating to or describing the figure. Conversely, where particular text referring to a figure is cited, the citation should be understood to include the figure as well.

A. INDEPENDENT CLAIM 1

CLAIM 1	InterSense IS-600
[1.pre] A method comprising:	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, a method. No party has yet asserted that the preamble is limiting, nor has the Court construed the preamble as limiting. However, to the extent that the preamble is limiting, it is disclosed by InterSense IS-600. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

Exhibit A-16

CLAIM 1	InterSense IS-600

IS-600 Mark 2

- *Fast & Smooth performance*
- *6-DOF Motion Prediction*
- *Wireless SoniDiscs™*
- *Immune to Magnetic Interference*

IS-600 Mark 2 PLUS

- *Upgraded Pentium™ Processor*
- *State-of -the art Ultrasonics*
- *Improved Resolution & Off-axis Accuracy*
- *Four tracked stations at 180 Hz*

IS-600 Mark 2 Precision Motion Trackers

Robust 6 degree-of-freedom motion tracking for simulation and training.

The IS-600 Mark 2 line delivers high-fidelity 6 Degree-of-Freedom (6-DOF) position and orientation tracking without the issues associated with other tracking technologies. Utilizing a hybrid of inertial and ultrasonic sensing technologies, the IS-600 Mark 2 achieves performance and robustness superior to any single-technology tracking device.

Superior Accuracy and Robustness
The IS-600 family uses InterSense's SensorFusion software to obtain superior position and orientation resolution and stability. Position tracking performance is enhanced by combining inertial sensors with ultrasonic drift correction, resulting in vastly improved update rates, resolution, and immunity to environmental interference.

Fast and Jitter-Free
The InterSense IS-600 design virtually eliminates the lag and jitter common to other systems, thus overcoming issues that are the source of simulator sickness in immersive head-mounted display applications.

Motion Prediction
The IS-600 can predict angular & position motion up to 50 ms, compensating for graphics rendering delays and minimizing simulator lag.

Four Operating Modes
GEOS™ Mode: Gyroscopic Earth-Stabilized Orientation Sensing for smooth sourceless 3-DOF orientation tracking with internal update rates up to 500 Hz.

PULSAR™ Mode: Pulsed Acoustic Ranging provides 3-DOF ultrasonic position tracking. Can be configured to run either hard-wired or wireless.

DUAL Mode: 6-DOF orientation and position tracking. The sensors operate independent of each other.

FUSION Mode: The best 6-DOF orientation and position tracking, using sensor fusion algorithms to combine inertial and ultrasonic measurements.

Distortion-Free
InterSense's patented inertial sensing technology is not susceptible to the electromagnetic interference common in other tracking systems, allowing the IS-600 to deliver smooth, steady performance, even in noisy, metal-cluttered environments.

Installation Flexibility
The X-bar is modular in design with detachable ReceiverPods, allowing custom configurations such as inside auto and flight simulators.

IS-600 Mark 2 PLUS Features
The Mark 2 PLUS offers millimeter resolution, improved stability, and increased noise immunity from environmental interference.

The Pentium processor allows four fusion mode stations to track simultaneously at 180 Hz.

Hardwired SoniDiscs provide maintenance free operation with a battery powered option available for configuration flexibility.

INTERSENSE

Intersense IS-600 Ex. 1 at 1.

Exhibit A-16

CLAIM 1	InterSense IS-600

1.1 Hardware System Description

1.1.1 InertiaCube™ integrated inertial instrument

Both the sourceless orientation tracking and the hybrid 6-DOF tracking product configurations make use of an ultra-miniature smart sensor module called the InertiaCube. The InertiaCube is a monolithic part based on micro-electro-mechanical systems (MEMS) technology involving no spinning wheels that might generate noise, inertial forces and mechanical failures. The InertiaCube simultaneously measures 9 physical properties, namely angular rates, linear accelerations, and magnetic field components along all 3 axes. Micro-miniature vibrating elements are employed to measure all the angular rate components and linear accelerations, with integral electronics and solid-state magnetometers. The magnetometers are included for optional yaw drift correction in the sourceless inertial orientation mode only. The geometry and composition of these elements are proprietary, but the functional performance of the multisensor unit can be understood sufficiently by reference to the equivalent diagram in Figure 1.

Intersense IS-600 Ex. 2 at 6.

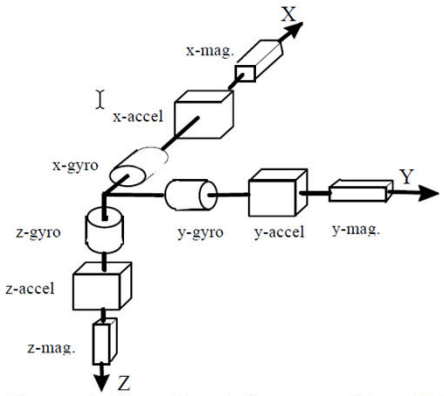


Figure 1: Functional diagram of InertiaCube

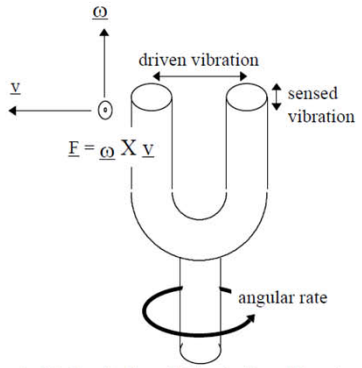


Figure 2: Principle of Coriolis vibratory gyroscope

Intersense IS-600 Ex. 2 at 7.

Exhibit A-16

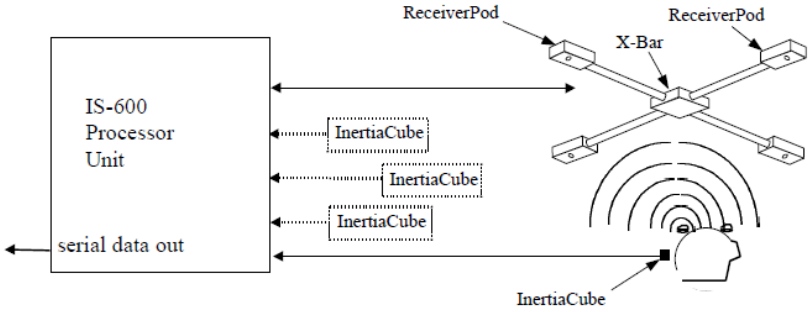
CLAIM 1	InterSense IS-600
	1.1.4 System Configuration Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.  **Figure 6: IS-600 HW diagram** The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections. Intersense IS-600 Ex. 2 at 9. *See also* Defendants' Invalidity Contentions for further discussion.
[1.a] mounting a sourceless orientation tracker on a user's head, and	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, mounting a sourceless orientation tracker on a user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

Exhibit A-16

CLAIM 1	InterSense IS-600

IS-600 Mark 2

- *Fast & Smooth performance*
- *6-DOF Motion Prediction*
- *Wireless SoniDiscs™*
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IS-600 Mark 2 PLUS

- *Upgraded Pentium™ Processor*
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Fast and Jitter-Free
The InterSense IS-600 design virtually eliminates the lag and jitter common to other systems, thus overcoming issues that are the source of simulator sickness in immersive head-mounted display applications.

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The IS-600 can predict angular & position motion up to 50 ms, compensating for graphics rendering delays and minimizing simulator lag.

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Distortion-Free
InterSense's patented inertial sensing technology is not susceptible to the electromagnetic interference common in other tracking systems, allowing the IS-600 to deliver smooth, steady performance, even in noisy, metal-cluttered environments.

Installation Flexibility
The X-bar is modular in design with detachable ReceiverPods, allowing custom configurations such as inside auto and flight simulators.

IS-600 Mark 2 PLUS Features
The Mark 2 PLUS offers millimeter resolution, improved stability, and increased noise immunity from environmental interference.

The Pentium processor allows four fusion mode stations to track simultaneously at 180 Hz.

Hardwired SoniDiscs provide maintenance free operation with a battery powered option available for configuration flexibility.

INTERSENSE

Intersense IS-600 Ex. 1 at 1.

Exhibit A-16

CLAIM 1	InterSense IS-600

1.1 Hardware System Description

1.1.1 InertiaCube™ integrated inertial instrument

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Intersense IS-600 Ex. 2 at 6.

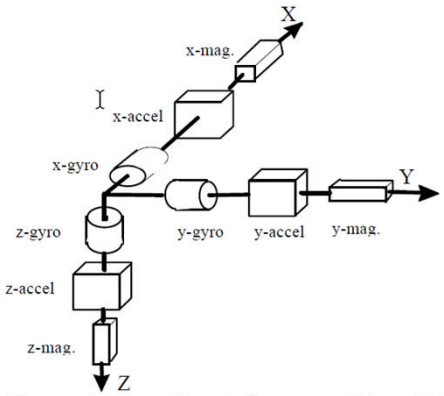

Figure 1: Functional diagram of InertiaCube

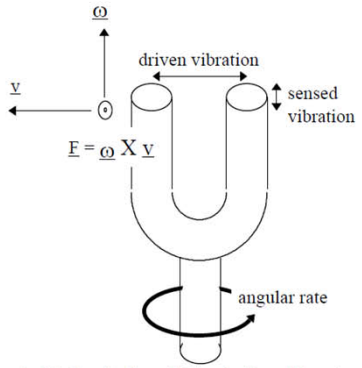

Figure 2: Principle of Coriolis vibratory gyroscope

Intersense IS-600 Ex. 2 at 7.

Exhibit A-16

CLAIM 1	InterSense IS-600

1.1.4 System Configuration

Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.

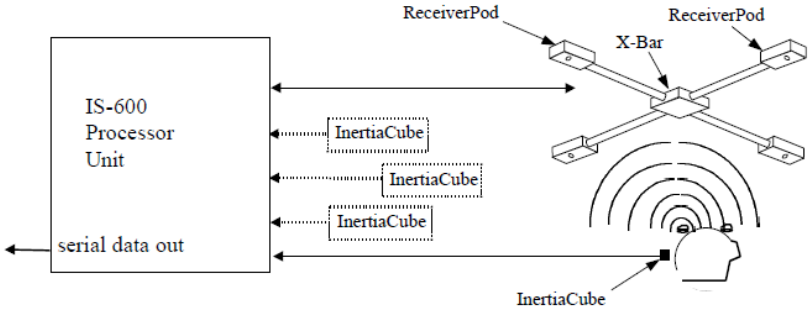

Figure 6: IS-600 HW diagram

The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections.

Intersense IS-600 Ex. 2 at 9.

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CLAIM 1	InterSense IS-600
	Perceptual Enhancement Level In order to provide the best performance for a large range of various applications, three levels of perceptual enhancement are available. None of the modes introduces any additional latency. 40 Mode 0 provides the best accuracy. The inertial tracker uses gyros to measure angular rotation rates for computing the sensor's orientation. To compensate for the gyroscopic drift, depending on the configuration, the tracker may use accelerometers, magnetometers or SoniDiscs to measure the actual physical orientation of the sensor. That data is then used to compute the necessary correction. In Mode 0 correction adjustments are made immediately, no jitter reduction algorithms are used. This results in somewhat jumpy output (not recommended for head tracking) but with lower RMS error. Use this mode for accuracy testing or for any application that requires best accuracy. Mode 1 provides accuracy similar to that of mode 0, with an addition of a jitter reduction algorithm. This algorithm reduces the accuracy by only a small amount and does not add any latency to the measurements. Mode 2 is recommended for use with HMD or other immersive applications. The drift correction adjustments are made smoothly and only while the sensor is moving, so as to be transparent to the user. Intersense IS-600 Ex. 2 at 40–41. *See also* Defendants' Invalidity Contentions for further discussion.
[1.b] using a position tracker to track a position of a first localized feature associated with a limb	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, using a position tracker to track a position of a first localized feature associated with a limb of the user relative to the user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

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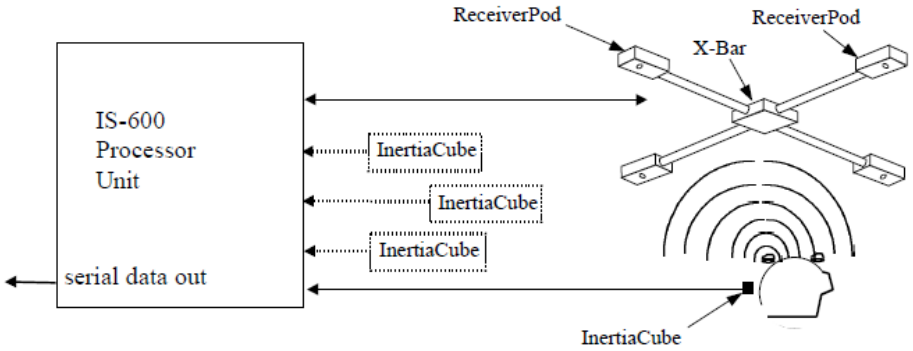
CLAIM 1	InterSense IS-600
of the user relative to the user's head.	1.1.4 System Configuration Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.  **Figure 6: IS-600 HW diagram** The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections. Intersense IS-600 Ex. 2 at 9.

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CLAIM 1	InterSense IS-600

4.4.3 Setup SoniDiscs

Terminology

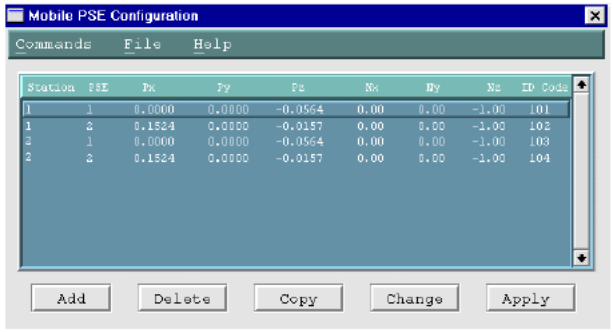
IS-600 and IS-900 models contain an ultrasonic subsystem that includes SoniDiscs (Ultrasonic Transponder Beacons) and ReceiverPods (Ultrasonic Receiver Modules). To generalize the interface protocol and configuration tools for these tracker models we defined a new term: PSE - Position Sensing Element.

A PSE may be Mobile or Fixed. Mobile PSE's are assigned to the stations and their movements are tracked by the system. Fixed PSEs form a CONSTELLATION™ and must not be moved. In the case of the IS-600 model tracker ReceiverPods are fixed and SoniDiscs are mobile.

Note:
All position data for Mobile and Fixed PSEs is entered in meters.

Mobile PSE Configuration

To track position, a station must have one or more SoniDiscs associated with it. This window lets you add, delete and configure these Mobile PSEs for all the stations. Current version of firmware lets you associate up to 3 SoniDiscs with any single station.



Intersense IS-600 Ex. 2 at 42.

Exhibit A-16

CLAIM 1	InterSense IS-600

When setting up a Fusion Mode station you must enter the positions of at least two SoniDiscs relative to the InertiaCube (Px, Py, and Pz in the screen above). The coordinate system for these values is the body of the InertiaCube where X is forward, Y is to the right and Z is down (see Figure 21). The origin is located in the exact center of the bottom of the base of the InertiaCube. The position of a SoniDisc is defined as the coordinates of the center of its top. All values are entered in meters. Please see Figure 21.

You must also enter the directional vector representing the orientation of the SoniDisc in the InertiaCube body coordinate frame. (Nx, Ny, and Nz in the screen above). This vector is perpendicular to the top of the SoniDisc and points outward.

Intersense IS-600 Ex. 2 at 42.

In the screen above you see two stations. First station is in the default two beacon configuration in which beacon with hardware ID 101 is located directly above the InertiaCube, and beacon with hardware ID 102 is located 15.24 centimeters (6 inches) in front of the InertiaCube. This corresponds to the InterSense two-beacon Fusion Mode mounting bracket provided with your tracker. All beacons are facing up, so the normal vector is 0.0, 0.0, -1.0.

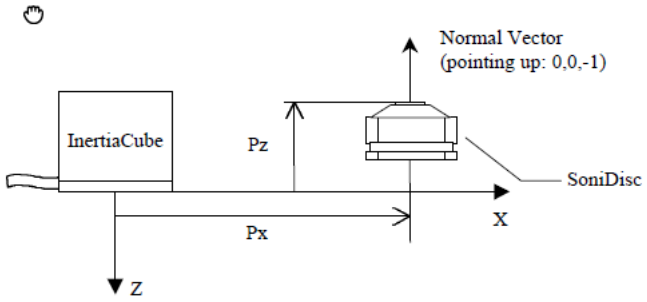


Figure 21. SoniDisc Coordinates

To change the configuration of a SoniDisc double click on the corresponding line or press Change.

Intersense IS-600 Ex. 2 at 43.

CLAIM 1	InterSense IS-600
	See also Defendants' Invalidity Contentions for further discussion.

B. DEPENDENT CLAIM 2

CLAIM 2	InterSense IS-600
[2] The method of claim 1 in which the first localized feature associated with the limb comprises a point on a hand-held object or a point on a hand-mounted object or a point on a hand.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 in which the first localized feature associated with the limb comprises a point on a hand-held object or a point on a hand-mounted object or a point on a hand. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

C. DEPENDENT CLAIM 4

CLAIM 4	InterSense IS-600
[4] The method of claim 2, wherein the first localized feature is on a ring.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 2, wherein the first localized feature is on a ring. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 2, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

D. DEPENDENT CLAIM 5

CLAIM 5	InterSense IS-600
[5] The method of claim 1 further comprising using the position tracker to determine a distance between the first localized feature and a second localized feature associated with the user's head.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 further comprising using the position tracker to determine a distance between the first localized feature and a second localized feature associated with the user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

Exhibit A-16

CLAIM 5	InterSense IS-600

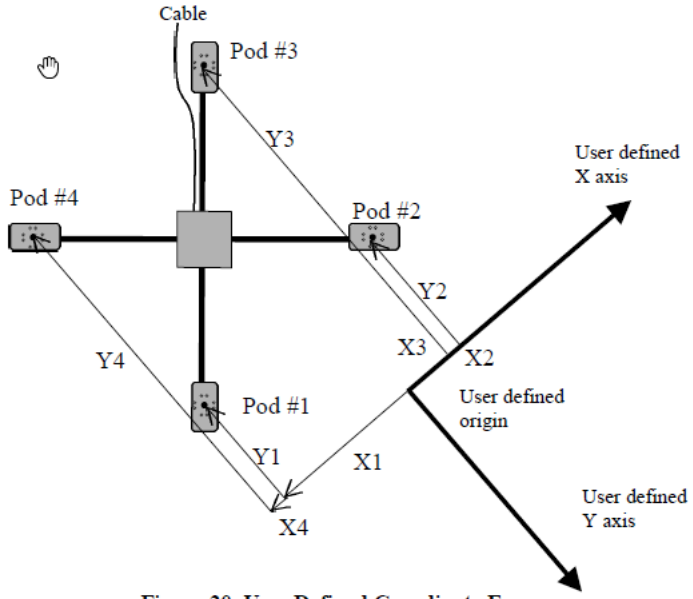


Figure 20. User Defined Coordinate Frame

1. Choose your 0,0,0 reference point. This can be anywhere in your working area as long as it is easy to make accurate, relative x, y & z measurements. The figure above shows a user defined X-Y axis, purposely at an angle to the X-Bar for illustration only.

2. Measure the distance from this reference point to the center bottom surface of the microphone on each ReceiverPod using x, y, z coordinates. You must use your own defined coordinate reference frame to make these measurements. This coordinate frame must be leveled in respect to gravity. In this illustration, the distance from the new reference point to the ReceiverPod 1 is X1, Y1 (Z1 not shown). ReceiverPod 2 is X2, Y2, Z2, and so on…

3. Enter these distances into ISDEMO as described in the "Parameters/Setup ReceiverPods" section.

InterSense IS-600 Ex. 2 at 28.

CLAIM 5	InterSense IS-600
	See Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

E. DEPENDENT CLAIM 7

CLAIM 7	InterSense IS-600
[7] The method of claim 1 in which the position tracker comprises an electro-optical system that tracks LEDs, optical sensors or reflective marks.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 in which the position tracker comprises an electro-optical system that tracks LEDs, optical sensors or reflective marks. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

F. DEPENDENT CLAIM 8

CLAIM 8	InterSense IS-600
[8] The method of claim 1 in which the position tracker comprises a video machine-vision device that recognizes the first localized feature.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 in which the position tracker comprises a video machine-vision device that recognizes the first localized feature. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

G. Dependent Claim 11

Claim 11	InterSense IS-600
[11] The method of claim 1 in which the sourceless orientation tracker comprises an inertial sensor.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 in which the sourceless orientation tracker comprises an inertial sensor. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

H. Dependent Claim 12

Claim 12	InterSense IS-600
[12] The method of claim 1 in which the sourceless orientation tracker comprises a tilt-sensor.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 in which the sourceless orientation tracker comprises a tilt-sensor. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

I. Dependent Claim 14

Claim 14	InterSense IS-600
[14] The method of claim 1 further comprising:	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1 further comprising mounting a display device on the user's head, and displaying a first object at a first position on the display device. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.

CLAIM 14	InterSense IS-600
mounting a display device on the user's head; and displaying a first object at a first position on the display device.	*See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

J. DEPENDENT CLAIM 15

CLAIM 15	InterSense IS-600
[15] The method of claim 14 further comprising: changing the orientation of the display device; and after changing the orientation of the display device, redisplaying the first object at a second position on the display device based on the change in orientation.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 14 further comprising changing the orientation of the display device, and after changing the orientation of the display device, redisplaying the first object at a second position on the display device based on the change in orientation. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 14, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

K. DEPENDENT CLAIM 16

CLAIM 16	InterSense IS-600
[16] The method of claim 15, wherein the second position is determined so as to make the position of the first object appear to be fixed relative to a first coordinate reference frame, which frame does not rotate with the display device during said changing of the orientation of the display device.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 15, wherein the second position is determined so as to make the position of the first object appear to be fixed relative to a first coordinate reference frame, which frame does not rotate with the display device during said changing of the orientation of the display device. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 15, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

L. DEPENDENT CLAIM 17

CLAIM 17	InterSense IS-600
[17] The method of claim 16, wherein the first object is displayed in response to a signal from a computer.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 16, wherein the first object is displayed in response to a signal from a computer. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 16, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

M. DEPENDENT CLAIM 18

CLAIM 18	InterSense IS-600
[18] The method of claim 17, further comprising: mounting a wearable computer on the user's body, and wherein the first object is displayed in response to a signal from the wearable computer.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 17, further comprising mounting a wearable computer on the user's body, and wherein the first object is displayed in response to a signal from the wearable computer. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 17, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

N. DEPENDENT CLAIM 19

CLAIM 19	InterSense IS-600
[19] The method of claim 15, further comprising displaying a portion of a virtual environment on the display device.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 15, further comprising displaying a portion of a virtual environment on the display device. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 15, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

O. DEPENDENT CLAIM 20

CLAIM 20	InterSense IS-600
[20] The method of claim 19, further comprising: displaying a portion of the virtual environment on the display device before changing the orientation of the display device, and displaying a different portion of the virtual environment on the display device after changing the orientation of the display device.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 19, further comprising displaying a portion of the virtual environment on the display device before changing the orientation of the display device, and displaying a different portion of the virtual environment on the display device after changing the orientation of the display device. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 19, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

P. DEPENDENT CLAIM 23

CLAIM 23	InterSense IS-600
[23] The method of claim 15, further comprising displaying a graphical user interface for a computer on the display device.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 15, further comprising displaying a graphical user interface for a computer on the display device. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 15, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

Q. Dependent Claim 24

Claim 24	InterSense IS-600
[24] The method of claim 23, wherein the first object is a window, icon or menu in the graphical user interface.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 23, wherein the first object is a window, icon or menu in the graphical user interface. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 23, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

R. Dependent Claim 25

Claim 25	InterSense IS-600
[25] The method of claim 23, wherein the first object is a pointer for the graphical user interface.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 23, wherein the first object is a pointer for the graphical user interface. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 23, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

S. Dependent Claim 26

Claim 26	InterSense IS-600
[26] The method of claim 16, further comprising: changing the position of the first localized feature	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 16, further comprising changing the position of the first localized feature relative to the position tracker, and after changing the position of the first localized feature, redisplaying the first object at a second position on the display device determined based on the change in the position of the first localized feature. In the alternative,

CLAIM 26	InterSense IS-600
relative to the position tracker; and after changing the position of the first localized feature, redisplaying the first object at a second position on the display device determined based on the change in the position of the first localized feature.	this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 16, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

T. DEPENDENT CLAIM 27

CLAIM 27	InterSense IS-600
[27] The method of claim 26, further comprising: displaying a second object on the display device, wherein after changing the position of the first localized feature, the displayed position of the second object on the display device does not	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 26 further comprising displaying a second object on the display device, wherein after changing the position of the first localized feature, the displayed position of the second object on the display device does not change in response to the change in the position of the first localized feature. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 26, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

CLAIM 27	InterSense IS-600
change in response to the change in the position of the first localized feature.	

U. DEPENDENT CLAIM 28

CLAIM 28	InterSense IS-600
[28] The method of claim 26, wherein the second position is determined so as to make the position of the first object appear to coincide with the position of the first localized feature as seen or felt by the user.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 26, wherein the second position is determined so as to make the position of the first object appear to coincide with the position of the first localized feature as seen or felt by the user. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 27, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

V. DEPENDENT CLAIM 29

CLAIM 29	InterSense IS-600
[29] The method of claim 17, further comprising: changing the orientation of the first coordinate reference frame in response to a signal	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 17, further comprising changing the orientation of the first coordinate reference frame in response to a signal being received by the computer. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 17, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

CLAIM 29	InterSense IS-600
being received by the computer.	

W. DEPENDENT CLAIM 30

CLAIM 30	InterSense IS-600
[30] The method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a change in the position of the first localized feature.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a change in the position of the first localized feature. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 29, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

X. DEPENDENT CLAIM 31

CLAIM 31	InterSense IS-600
[31] The method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a signal representative of the location of the user.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a signal representative of the location of the user. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 29, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

Y. DEPENDENT CLAIM 32

CLAIM 32	InterSense IS-600
[32] The method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a signal representative of a destination.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a signal representative of a destination. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 29, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

Z. DEPENDENT CLAIM 33

CLAIM 33	InterSense IS-600
[33] The method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a signal representative of a change in the user's immediate surroundings.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, method of claim 29, wherein the orientation of the first coordinate reference frame is changed in response to a signal representative of a change in the user's immediate surroundings. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 29, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

AA. DEPENDENT CLAIM 35

CLAIM 35	InterSense IS-600
[35] The method of claim 27, wherein redisplaying the first object further comprises changing the apparent size of the first object according to the change in position of the first localized feature.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 27, wherein redisplaying the first object further comprises changing the apparent size of the first object according to the change in position of the first localized feature. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 27, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

BB. DEPENDENT CLAIM 41

CLAIM 41	InterSense IS-600
[41] The method of claim 16, further comprising: displaying the first object at a third position; after displaying the first object at the third position, changing the orientation of the display; and after changing the orientation of the display, continuing to	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 16, further comprising displaying the first object at a third position, after displaying the first object at the third position, changing the orientation of the display, and after changing the orientation of the display, continuing to display the first object at the third position. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 16, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

CLAIM 41	InterSense IS-600
display the first object at the third position.	

CC. DEPENDENT CLAIM 45

CLAIM 45	InterSense IS-600
[45] The method of claim 1, further comprising: positioning the first localized feature at a first point; positioning the first localized feature at a second point; and calculating the distance between the first point and the second point.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1, further comprising positioning the first localized feature at a first point, positioning the first localized feature at a second point, and calculating the distance between the first point and the second point. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

DD. DEPENDENT CLAIM 46

CLAIM 46	InterSense IS-600
[46] The method of claim 1, further comprising: determining a position vector of the first localized feature relative to a second localized feature associated with the user's head; and transforming the position vector based on an orientation of the user's head.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1, further comprising determining a position vector of the first localized feature relative to a second localized feature associated with the user's head, and transforming the position vector based on an orientation of the user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

EE. DEPENDENT CLAIM 47

CLAIM 47	InterSense IS-600
[47] The method of claim 46, further comprising: setting an assumed position for the user's head in a coordinate system; and	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 46, further comprising setting an assumed position for the user's head in a coordinate system, and setting a position for the first localized feature in the coordinate system based on the assumed position of the user's head and said position vector. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 46, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

CLAIM 47	InterSense IS-600
setting a position for the first localized feature in the coordinate system based on the assumed position of the user's head and said position vector.	

FF. DEPENDENT CLAIM 48

CLAIM 48	InterSense IS-600
[48] The method of claim 47, where setting a position for the first localized feature further comprises: measuring the orientation of the user's head relative to a fixed frame of reference.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 47, where setting a position for the first localized feature further comprises measuring the orientation of the user's head relative to a fixed frame of reference. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 47, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

GG. DEPENDENT CLAIM 50

CLAIM 50	InterSense IS-600
[50] The method of claim 1, wherein the sourceless orientation	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 1, wherein the sourceless orientation tracker comprises a first inertial sensor, and further comprising mounting a second inertial sensor elsewhere on the user's body or in an object held by the user, and

Exhibit A-16

CLAIM 50	InterSense IS-600
tracker comprises a first inertial sensor, and further comprising: mounting a second inertial sensor elsewhere on the user's body or in an object held by the user; and tracking the position of one inertial sensor relative to the other.	tracking the position of one inertial sensor relative to the other. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

Exhibit A-16

CLAIM 50	InterSense IS-600

IS-600 Mark 2

- *Fast & Smooth performance*
- *6-DOF Motion Prediction*
- *Wireless SoniDiscs™*
- *Immune to Magnetic Interference*

IS-600 Mark 2 PLUS

- *Upgraded Pentium™ Processor*
- *State-of -the art Ultrasonics*
- *Improved Resolution & Off-axis Accuracy*
- *Four tracked stations at 180 Hz*

IS-600 Mark 2 Precision Motion Trackers

Robust 6 degree-of-freedom motion tracking for simulation and training.

The IS-600 Mark 2 line delivers high-fidelity 6 Degree-of-Freedom (6-DOF) position and orientation tracking without the issues associated with other tracking technologies. Utilizing a hybrid of inertial and ultrasonic sensing technologies, the IS-600 Mark 2 achieves performance and robustness superior to any single-technology tracking device.

Superior Accuracy and Robustness
The IS-600 family uses InterSense's SensorFusion software to obtain superior position and orientation resolution and stability. Position tracking performance is enhanced by combining inertial sensors with ultrasonic drift correction, resulting in vastly improved update rates, resolution, and immunity to environmental interference.

Fast and Jitter-Free
The InterSense IS-600 design virtually eliminates the lag and jitter common to other systems, thus overcoming issues that are the source of simulator sickness in immersive head-mounted display applications.

Motion Prediction
The IS-600 can predict angular & position motion up to 50 ms, compensating for graphics rendering delays and minimizing simulator lag.

Four Operating Modes
GEOS™ Mode: Gyroscopic Earth-Stabilized Orientation Sensing for smooth sourceless 3-DOF orientation tracking with internal update rates up to 500 Hz.

PULSAR™ Mode: Pulsed Acoustic Ranging provides 3-DOF ultrasonic position tracking. Can be configured to run either hard-wired or wireless.

DUAL Mode: 6-DOF orientation and position tracking. The sensors operate independent of each other.

FUSION Mode: The best 6-DOF orientation and position tracking, using sensor fusion algorithms to combine inertial and ultrasonic measurements.

Distortion-Free
InterSense's patented inertial sensing technology is not susceptible to the electromagnetic interference common in other tracking systems, allowing the IS-600 to deliver smooth, steady performance, even in noisy, metal-cluttered environments.

Installation Flexibility
The X-bar is modular in design with detachable ReceiverPods, allowing custom configurations such as inside auto and flight simulators.

IS-600 Mark 2 PLUS Features
The Mark 2 PLUS offers millimeter resolution, improved stability, and increased noise immunity from environmental interference.

The Pentium processor allows four fusion mode stations to track simultaneously at 180 Hz.

Hardwired SoniDiscs provide maintenance free operation with a battery powered option available for configuration flexibility.

INTERSENSE

Intersense IS-600 Ex. 1 at 1.

Exhibit A-16

CLAIM 50	InterSense IS-600

1.1 Hardware System Description

1.1.1 InertiaCube™ integrated inertial instrument

Both the sourceless orientation tracking and the hybrid 6-DOF tracking product configurations make use of an ultra-miniature smart sensor module called the InertiaCube. The InertiaCube is a monolithic part based on micro-electro-mechanical systems (MEMS) technology involving no spinning wheels that might generate noise, inertial forces and mechanical failures. The InertiaCube simultaneously measures 9 physical properties, namely angular rates, linear accelerations, and magnetic field components along all 3 axes. Micro-miniature vibrating elements are employed to measure all the angular rate components and linear accelerations, with integral electronics and solid-state magnetometers. The magnetometers are included for optional yaw drift correction in the sourceless inertial orientation mode only. The geometry and composition of these elements are proprietary, but the functional performance of the multisensor unit can be understood sufficiently by reference to the equivalent diagram in Figure 1.

Intersense IS-600 Ex. 2 at 6.

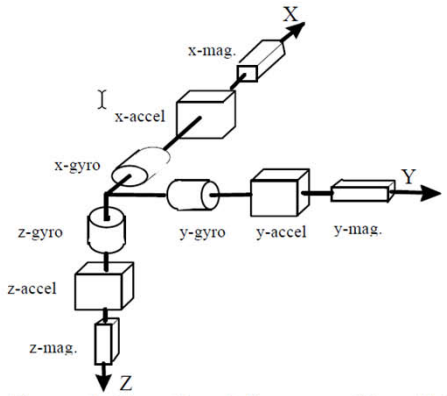


Figure 1: Functional diagram of InertiaCube

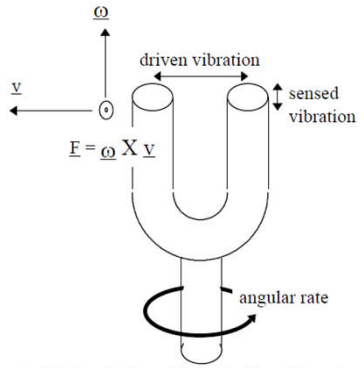


Figure 2: Principle of Coriolis vibratory gyroscope

Intersense IS-600 Ex. 2 at 7.

Exhibit A-16

CLAIM 50	InterSense IS-600

1.1.4 System Configuration

Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.

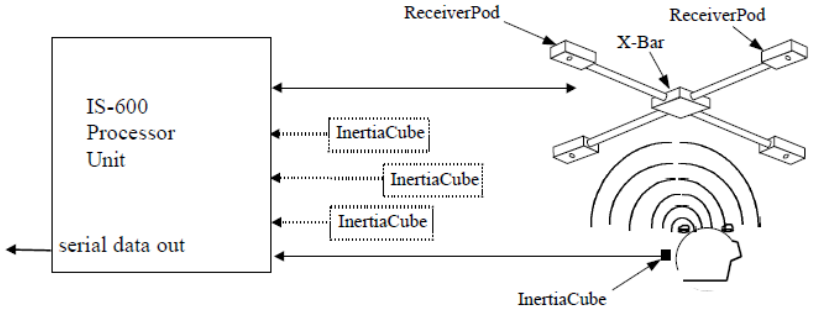


Figure 6: IS-600 HW diagram

The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections.

Intersense IS-600 Ex. 2 at 9.

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CLAIM 50	InterSense IS-600

Perceptual Enhancement Level

In order to provide the best performance for a large range of various applications, three levels of perceptual enhancement are available. None of the modes introduces any additional latency.

40

Mode 0 provides the best accuracy. The inertial tracker uses gyros to measure angular rotation rates for computing the sensor's orientation. To compensate for the gyroscopic drift, depending on the configuration, the tracker may use accelerometers, magnetometers or SoniDiscs to measure the actual physical orientation of the sensor. That data is then used to compute the necessary correction. In Mode 0 correction adjustments are made immediately, no jitter reduction algorithms are used. This results in somewhat jumpy output (not recommended for head tracking) but with lower RMS error. Use this mode for accuracy testing or for any application that requires best accuracy.

Mode 1 provides accuracy similar to that of mode 0, with an addition of a jitter reduction algorithm. This algorithm reduces the accuracy by only a small amount and does not add any latency to the measurements.

Mode 2 is recommended for use with HMD or other immersive applications. The drift correction adjustments are made smoothly and only while the sensor is moving, so as to be transparent to the user.

Intersense IS-600 Ex. 2 at 40–41.

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CLAIM 50	InterSense IS-600

2 Specifications and Performance Characteristics

Performance Specifications The following performance specifications can be achieved when tracking one station in Fusion Mode in the region directly below the X-Bar. There will be a graceful degradation of performance when tracking multiple stations or when tracking in the outer extents of the working volume.

Specifications

Maximum Angular Rate:	1200°/sec
Angular Resolution:	0.05° RMS
Angular Accuracy:	0.2° RMS
Maximum Linear Velocity:	15'/sec
Translation Resolution:	1.5mm RMS
Translation Accuracy:	4mm RMS
Prediction:	0-50ms
Number of InertiaCube Sensors:	up to 4
Number of SoniDisc Beacons:	up to 8
Orientation Update Rate:	up to 500Hz
Position Update Rate:	180Hz
Interface:	RS-232C with selectable baud rates to 115,200
Protocol:	Compatible with industry-standard protocol (FASTRAK™)

Max. System Configurations:

GEOS	PULSAR	DUAL	FUSION
4 orientation-only stations	8 position-only stations	4 6-DOF stations	4 6-DOF stations

Or any combination of Operating Modes that make use of 4 InertiaCubes and 8 SoniDiscs

Intersense IS-600 Ex. 2 at 15.

See Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

HH. INDEPENDENT CLAIM 54

CLAIM 54	InterSense IS-600
[54.pre] A tracking system comprising	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, a tracking system. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; s*ee also* Defendants' Invalidity Contentions for further discussion.
[54.a] a sourceless orientation tracker for mounting on a user's head, and	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, a sourceless orientation tracker for mounting on a user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

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CLAIM 54	InterSense IS-600

IS-600 Mark 2

- *Fast & Smooth performance*
- *6-DOF Motion Prediction*
- *Wireless SoniDiscs™*
- *Immune to Magnetic Interference*

IS-600 Mark 2 PLUS

- *Upgraded Pentium™ Processor*
- *State-of -the art Ultrasonics*
- *Improved Resolution & Off-axis Accuracy*
- *Four tracked stations at 180 Hz*

IS-600 Mark 2 Precision Motion Trackers

Robust 6 degree-of-freedom motion tracking for simulation and training.

The IS-600 Mark 2 line delivers high-fidelity 6 Degree-of-Freedom (6-DOF) position and orientation tracking without the issues associated with other tracking technologies. Utilizing a hybrid of inertial and ultrasonic sensing technologies, the IS-600 Mark 2 achieves performance and robustness superior to any single-technology tracking device.

Superior Accuracy and Robustness
The IS-600 family uses InterSense's SensorFusion software to obtain superior position and orientation resolution and stability. Position tracking performance is enhanced by combining inertial sensors with ultrasonic drift correction, resulting in vastly improved update rates, resolution, and immunity to environmental interference.

Fast and Jitter-Free
The InterSense IS-600 design virtually eliminates the lag and jitter common to other systems, thus overcoming issues that are the source of simulator sickness in immersive head-mounted display applications.

Motion Prediction
The IS-600 can predict angular & position motion up to 50 ms, compensating for graphics rendering delays and minimizing simulator lag.

Four Operating Modes
GEOS™ Mode: Gyroscopic Earth-Stabilized Orientation Sensing for smooth sourceless 3-DOF orientation tracking with internal update rates up to 500 Hz.

PULSAR™ Mode: Pulsed Acoustic Ranging provides 3-DOF ultrasonic position tracking. Can be configured to run either hard-wired or wireless.

DUAL Mode: 6-DOF orientation and position tracking. The sensors operate independent of each other.

FUSION Mode: The best 6-DOF orientation and position tracking, using sensor fusion algorithms to combine inertial and ultrasonic measurements.

Distortion-Free
InterSense's patented inertial sensing technology is not susceptible to the electromagnetic interference common in other tracking systems, allowing the IS-600 to deliver smooth, steady performance, even in noisy, metal-cluttered environments.

Installation Flexibility
The X-bar is modular in design with detachable ReceiverPods, allowing custom configurations such as inside auto and flight simulators.

IS-600 Mark 2 PLUS Features
The Mark 2 PLUS offers millimeter resolution, improved stability, and increased noise immunity from environmental interference.

The Pentium processor allows four fusion mode stations to track simultaneously at 180 Hz.

Hardwired SoniDiscs provide maintenance free operation with a battery powered option available for configuration flexibility.

INTERSENSE

Intersense IS-600 Ex. 1 at 1.

Exhibit A-16

CLAIM 54	InterSense IS-600

1.1 Hardware System Description

1.1.1 InertiaCube™ integrated inertial instrument

Both the sourceless orientation tracking and the hybrid 6-DOF tracking product configurations make use of an ultra-miniature smart sensor module called the InertiaCube. The InertiaCube is a monolithic part based on micro-electro-mechanical systems (MEMS) technology involving no spinning wheels that might generate noise, inertial forces and mechanical failures. The InertiaCube simultaneously measures 9 physical properties, namely angular rates, linear accelerations, and magnetic field components along all 3 axes. Micro-miniature vibrating elements are employed to measure all the angular rate components and linear accelerations, with integral electronics and solid-state magnetometers. The magnetometers are included for optional yaw drift correction in the sourceless inertial orientation mode only. The geometry and composition of these elements are proprietary, but the functional performance of the multisensor unit can be understood sufficiently by reference to the equivalent diagram in Figure 1.

Intersense IS-600 Ex. 2 at 6.

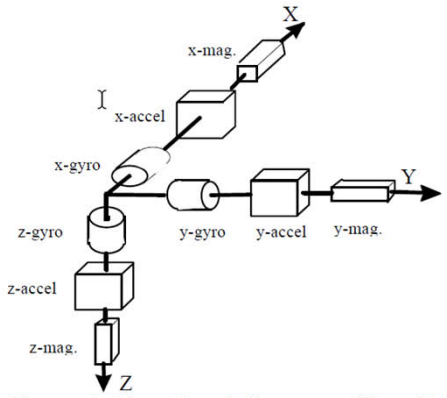

Figure 1: Functional diagram of InertiaCube

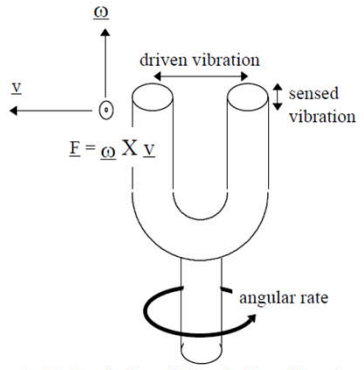

Figure 2: Principle of Coriolis vibratory gyroscope

Intersense IS-600 Ex. 2 at 7.

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CLAIM 54	InterSense IS-600

1.1.4 System Configuration

Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.

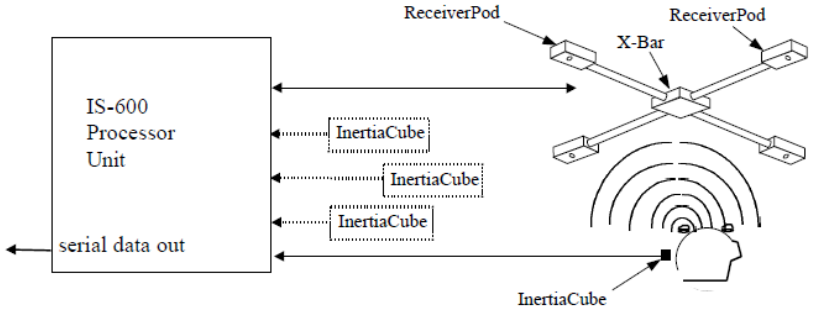


Figure 6: IS-600 HW diagram

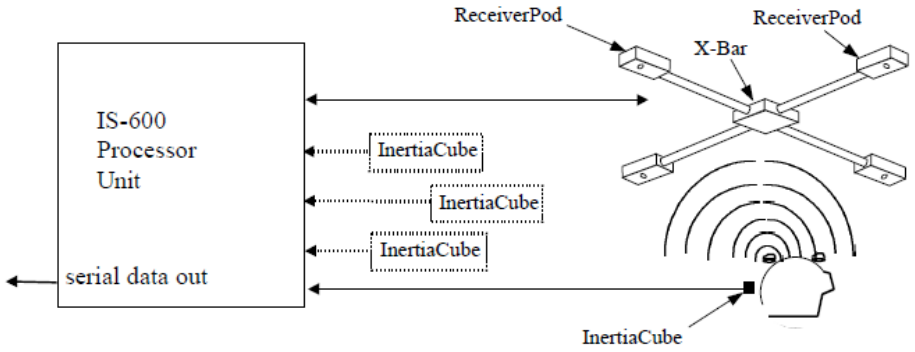
The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections.

Intersense IS-600 Ex. 2 at 9.

Exhibit A-16

CLAIM 54	InterSense IS-600
	Perceptual Enhancement Level In order to provide the best performance for a large range of various applications, three levels of perceptual enhancement are available. None of the modes introduces any additional latency. 40 Mode 0 provides the best accuracy. The inertial tracker uses gyros to measure angular rotation rates for computing the sensor's orientation. To compensate for the gyroscopic drift, depending on the configuration, the tracker may use accelerometers, magnetometers or SoniDiscs to measure the actual physical orientation of the sensor. That data is then used to compute the necessary correction. In Mode 0 correction adjustments are made immediately, no jitter reduction algorithms are used. This results in somewhat jumpy output (not recommended for head tracking) but with lower RMS error. Use this mode for accuracy testing or for any application that requires best accuracy. Mode 1 provides accuracy similar to that of mode 0, with an addition of a jitter reduction algorithm. This algorithm reduces the accuracy by only a small amount and does not add any latency to the measurements. Mode 2 is recommended for use with HMD or other immersive applications. The drift correction adjustments are made smoothly and only while the sensor is moving, so as to be transparent to the user. Intersense IS-600 Ex. 2 at 40–41. *See* Disclosures with respect to Claim 1, *supra*; s*ee also* Defendants' Invalidity Contentions for further discussion.
[54.b] a position tracker adapted to track a position of a first localized feature	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, a position tracker adapted to track a position of a first localized feature associated with a limb of the user relative to the user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.

Exhibit A-16

CLAIM 54	InterSense IS-600
associated with a limb of the user relative to the user's head.	*See, e.g.*: **1.1.4 System Configuration** Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.  **Figure 6: IS-600 HW diagram** The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections. Intersense IS-600 Ex. 2 at 9. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

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II. INDEPENDENT CLAIM 56

CLAIM 56	InterSense IS-600
[56.pre] A system comprising:	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, a system. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.
[56.a] mounting a first inertial sensor on a user's head;	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, mounting a first inertial sensor on a user's head. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art.

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CLAIM 56	InterSense IS-600

IS-600 Mark 2

- *Fast & Smooth performance*
- *6-DOF Motion Prediction*
- *Wireless SoniDiscs™*
- *Immune to Magnetic Interference*

IS-600 Mark 2 PLUS

- *Upgraded Pentium™ Processor*
- *State-of -the art Ultrasonics*
- *Improved Resolution & Off-axis Accuracy*
- *Four tracked stations at 180 Hz*

IS-600 Mark 2 Precision Motion Trackers

Robust 6 degree-of-freedom motion tracking for simulation and training.

The IS-600 Mark 2 line delivers high-fidelity 6 Degree-of-Freedom (6-DOF) position and orientation tracking without the issues associated with other tracking technologies. Utilizing a hybrid of inertial and ultrasonic sensing technologies, the IS-600 Mark 2 achieves performance and robustness superior to any single-technology tracking device.

Superior Accuracy and Robustness
The IS-600 family uses InterSense's SensorFusion software to obtain superior position and orientation resolution and stability. Position tracking performance is enhanced by combining inertial sensors with ultrasonic drift correction, resulting in vastly improved update rates, resolution, and immunity to environmental interference.

Fast and Jitter-Free
The InterSense IS-600 design virtually eliminates the lag and jitter common to other systems, thus overcoming issues that are the source of simulator sickness in immersive head-mounted display applications.

Motion Prediction
The IS-600 can predict angular & position motion up to 50 ms, compensating for graphics rendering delays and minimizing simulator lag.

Four Operating Modes
GEOS™ Mode: Gyroscopic Earth-Stabilized Orientation Sensing for smooth sourceless 3-DOF orientation tracking with internal update rates up to 500 Hz.

PULSAR™ Mode: Pulsed Acoustic Ranging provides 3-DOF ultrasonic position tracking. Can be configured to run either hard-wired or wireless.

DUAL Mode: 6-DOF orientation and position tracking. The sensors operate independent of each other.

FUSION Mode: The best 6-DOF orientation and position tracking, using sensor fusion algorithms to combine inertial and ultrasonic measurements.

Distortion-Free
InterSense's patented inertial sensing technology is not susceptible to the electromagnetic interference common in other tracking systems, allowing the IS-600 to deliver smooth, steady performance, even in noisy, metal-cluttered environments.

Installation Flexibility
The X-bar is modular in design with detachable ReceiverPods, allowing custom configurations such as inside auto and flight simulators.

IS-600 Mark 2 PLUS Features
The Mark 2 PLUS offers millimeter resolution, improved stability, and increased noise immunity from environmental interference.

The Pentium processor allows four fusion mode stations to track simultaneously at 180 Hz.

Hardwired SoniDiscs provide maintenance free operation with a battery powered option available for configuration flexibility.

INTERSENSE

Intersense IS-600 Ex. 1 at 1.

Exhibit A-16

CLAIM 56	InterSense IS-600

1.1 Hardware System Description

1.1.1 InertiaCube™ integrated inertial instrument

Both the sourceless orientation tracking and the hybrid 6-DOF tracking product configurations make use of an ultra-miniature smart sensor module called the InertiaCube. The InertiaCube is a monolithic part based on micro-electro-mechanical systems (MEMS) technology involving no spinning wheels that might generate noise, inertial forces and mechanical failures. The InertiaCube simultaneously measures 9 physical properties, namely angular rates, linear accelerations, and magnetic field components along all 3 axes. Micro-miniature vibrating elements are employed to measure all the angular rate components and linear accelerations, with integral electronics and solid-state magnetometers. The magnetometers are included for optional yaw drift correction in the sourceless inertial orientation mode only. The geometry and composition of these elements are proprietary, but the functional performance of the multisensor unit can be understood sufficiently by reference to the equivalent diagram in Figure 1.

Intersense IS-600 Ex. 2 at 6.

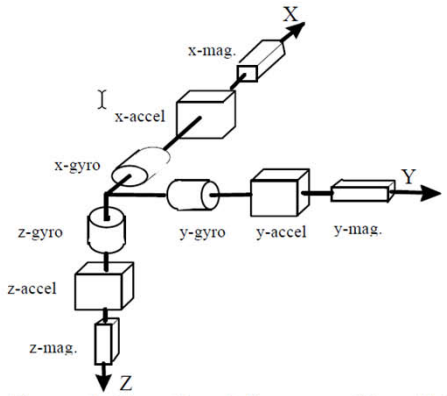

Figure 1: Functional diagram of InertiaCube

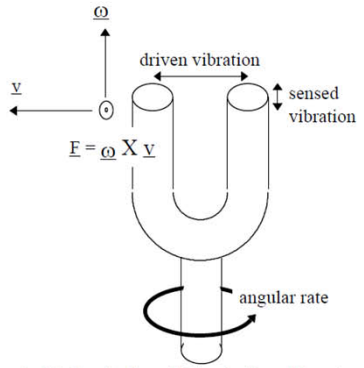

Figure 2: Principle of Coriolis vibratory gyroscope

Intersense IS-600 Ex. 2 at 7.

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CLAIM 56	InterSense IS-600

1.1.4 System Configuration

Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.

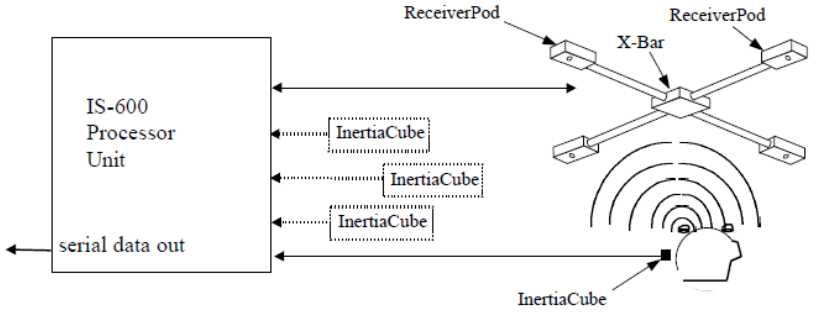

Figure 6: IS-600 HW diagram

The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections.

Intersense IS-600 Ex. 2 at 9.

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CLAIM 56	InterSense IS-600
	Perceptual Enhancement Level In order to provide the best performance for a large range of various applications, three levels of perceptual enhancement are available. None of the modes introduces any additional latency. 40 Mode 0 provides the best accuracy. The inertial tracker uses gyros to measure angular rotation rates for computing the sensor's orientation. To compensate for the gyroscopic drift, depending on the configuration, the tracker may use accelerometers, magnetometers or SoniDiscs to measure the actual physical orientation of the sensor. That data is then used to compute the necessary correction. In Mode 0 correction adjustments are made immediately, no jitter reduction algorithms are used. This results in somewhat jumpy output (not recommended for head tracking) but with lower RMS error. Use this mode for accuracy testing or for any application that requires best accuracy. Mode 1 provides accuracy similar to that of mode 0, with an addition of a jitter reduction algorithm. This algorithm reduces the accuracy by only a small amount and does not add any latency to the measurements. Mode 2 is recommended for use with HMD or other immersive applications. The drift correction adjustments are made smoothly and only while the sensor is moving, so as to be transparent to the user. Intersense IS-600 Ex. 2 at 40–41. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.
[56.b] mounting a second inertial sensor elsewhere on the user's body or in an object held by the user; and	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, mounting a second inertial sensor elsewhere on the user's body or in an object held by the user. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:

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CLAIM 56	InterSense IS-600

3 Setting up your new IS-300

3.1 IS-300 Components

IS-300 Base Unit The base unit is the processing engine of the IS-300 system. It has the following connections:

InertiaCubes (up to 4)	via cable attached to the InertiaCubes
Power	via 12V DC power supply.
User's Computer	via null modem RS232 cable

The base unit should be installed in a clean, dry environment.

InterSense IS-600 Ex. 3 at 12.

InertiaCube Number InterSense trackers support up to 4 InertiaCubes. You must assign and InertiaCube to the station in order to track orientation.

InterSense IS-600 Ex. 3 at 23.

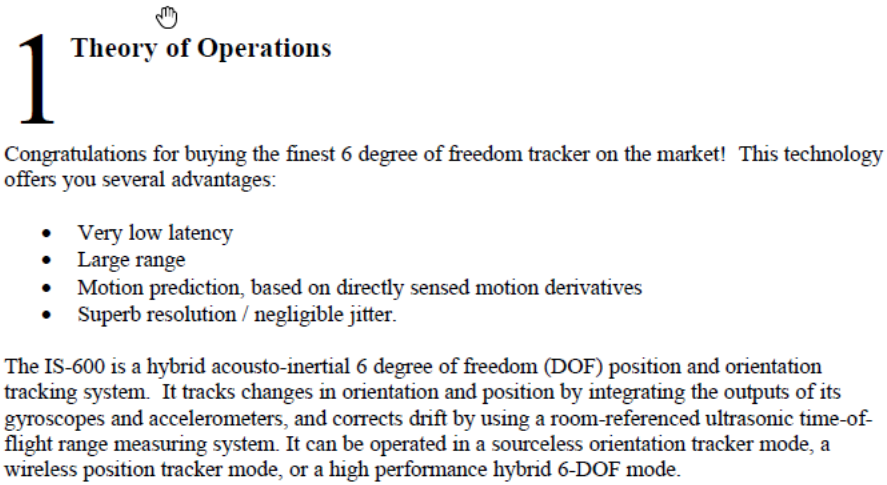
CLAIM 56	InterSense IS-600
	See Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.
[56.c] tracking the position of one inertial sensor relative to the other.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, tracking the position of one inertial sensor relative to the other. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 1, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

JJ. DEPENDENT CLAIM 57

CLAIM 57	InterSense IS-600
[57] The method of claim 56, further comprising: sensing data at the first and second inertial sensors and using the sensed data to track the position of one inertial sensor relative to the other.	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 56, further comprising sensing data at the first and second inertial sensors and using the sensed data to track the position of one inertial sensor relative to the other. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See* Disclosures with respect to Claim 56, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

KK. DEPENDENT CLAIM 58

CLAIM 58	InterSense IS-600
[58] The method of claim 57, wherein	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 57, wherein tracking the position of the inertial sensor is done without reference to any signal

CLAIM 58	InterSense IS-600
tracking the position of the inertial sensor is done without reference to any signal received from a source not mounted on or held by the user.	received from a source not mounted on or held by the user. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*:  1 Theory of Operations Congratulations for buying the finest 6 degree of freedom tracker on the market! This technology offers you several advantages: • Very low latency • Large range • Motion prediction, based on directly sensed motion derivatives • Superb resolution / negligible jitter. The IS-600 is a hybrid acousto-inertial 6 degree of freedom (DOF) position and orientation tracking system. It tracks changes in orientation and position by integrating the outputs of its gyroscopes and accelerometers, and corrects drift by using a room-referenced ultrasonic time-of-flight range measuring system. It can be operated in a sourceless orientation tracker mode, a wireless position tracker mode, or a high performance hybrid 6-DOF mode. InterSense IS-600 Ex. 2 at 6. *See* Disclosures with respect to Claim 57, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.

LL. DEPENDENT CLAIM 59

CLAIM 59	InterSense IS-600
[59] The method of claim 58, wherein the drift of the relative position or orientation of	At least under Plaintiffs' apparent infringement theory, InterSense IS-600 discloses, either expressly or inherently, the method of claim 58, wherein the drift of the relative position or orientation of the second inertial sensor relative to the first inertial sensor is corrected by measurements between devices on the user's head and devices elsewhere

Exhibit A-16

CLAIM 59	InterSense IS-600
the second inertial sensor relative to the first inertial sensor is corrected by measurements between devices on the user's head and devices elsewhere on the users body.	on the users body. In the alternative, this element would be obvious over InterSense IS-600 in light of the other references disclosed in Defendants' Invalidity Contentions and/or the knowledge of one of ordinary skill in the art. *See, e.g.*: 1 **Theory of Operations** Congratulations for buying the finest 6 degree of freedom tracker on the market! This technology offers you several advantages: • Very low latency • Large range • Motion prediction, based on directly sensed motion derivatives • Superb resolution / negligible jitter. The IS-600 is a hybrid acousto-inertial 6 degree of freedom (DOF) position and orientation tracking system. It tracks changes in orientation and position by integrating the outputs of its gyroscopes and accelerometers, and corrects drift by using a room-referenced ultrasonic time-of-flight range measuring system. It can be operated in a sourceless orientation tracker mode, a wireless position tracker mode, or a high performance hybrid 6-DOF mode. InterSense IS-600 Ex. 2 at 6.

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CLAIM 59	InterSense IS-600

IS-600 Mark 2

- *Fast & Smooth performance*
- *6-DOF Motion Prediction*
- *Wireless SoniDiscs™*
- *Immune to Magnetic Interference*

IS-600 Mark 2 PLUS

- *Upgraded Pentium™ Processor*
- *State-of -the art Ultrasonics*
- *Improved Resolution & Off-axis Accuracy*
- *Four tracked stations at 180 Hz*

IS-600 Mark 2 Precision Motion Trackers

Robust 6 degree-of-freedom motion tracking for simulation and training.

The IS-600 Mark 2 line delivers high-fidelity 6 Degree-of-Freedom (6-DOF) position and orientation tracking without the issues associated with other tracking technologies. Utilizing a hybrid of inertial and ultrasonic sensing technologies, the IS-600 Mark 2 achieves performance and robustness superior to any single-technology tracking device.

Superior Accuracy and Robustness
The IS-600 family uses InterSense's SensorFusion software to obtain superior position and orientation resolution and stability. Position tracking performance is enhanced by combining inertial sensors with ultrasonic drift correction, resulting in vastly improved update rates, resolution, and immunity to environmental interference.

Fast and Jitter-Free
The InterSense IS-600 design virtually eliminates the lag and jitter common to other systems, thus overcoming issues that are the source of simulator sickness in immersive head-mounted display applications.

Motion Prediction
The IS-600 can predict angular & position motion up to 50 ms, compensating for graphics rendering delays and minimizing simulator lag.

Four Operating Modes
GEOS™ Mode: Gyroscopic Earth-Stabilized Orientation Sensing for smooth sourceless 3-DOF orientation tracking with internal update rates up to 500 Hz.

PULSAR™ Mode: Pulsed Acoustic Ranging provides 3-DOF ultrasonic position tracking. Can be configured to run either hard-wired or wireless.

DUAL Mode: 6-DOF orientation and position tracking. The sensors operate independent of each other.

FUSION Mode: The best 6-DOF orientation and position tracking, using sensor fusion algorithms to combine inertial and ultrasonic measurements.

Distortion-Free
InterSense's patented inertial sensing technology is not susceptible to the electromagnetic interference common in other tracking systems, allowing the IS-600 to deliver smooth, steady performance, even in noisy, metal-cluttered environments.

Installation Flexibility
The X-bar is modular in design with detachable ReceiverPods, allowing custom configurations such as inside auto and flight simulators.

IS-600 Mark 2 PLUS Features
The Mark 2 PLUS offers millimeter resolution, improved stability, and increased noise immunity from environmental interference.

The Pentium processor allows four fusion mode stations to track simultaneously at 180 Hz.

Hardwired SoniDiscs provide maintenance free operation with a battery powered option available for configuration flexibility.

INTERSENSE

Intersense IS-600 Ex. 1 at 1.

Exhibit A-16

CLAIM 59	InterSense IS-600

1.1 Hardware System Description

1.1.1 InertiaCube™ integrated inertial instrument

Both the sourceless orientation tracking and the hybrid 6-DOF tracking product configurations make use of an ultra-miniature smart sensor module called the InertiaCube. The InertiaCube is a monolithic part based on micro-electro-mechanical systems (MEMS) technology involving no spinning wheels that might generate noise, inertial forces and mechanical failures. The InertiaCube simultaneously measures 9 physical properties, namely angular rates, linear accelerations, and magnetic field components along all 3 axes. Micro-miniature vibrating elements are employed to measure all the angular rate components and linear accelerations, with integral electronics and solid-state magnetometers. The magnetometers are included for optional yaw drift correction in the sourceless inertial orientation mode only. The geometry and composition of these elements are proprietary, but the functional performance of the multisensor unit can be understood sufficiently by reference to the equivalent diagram in Figure 1.

Intersense IS-600 Ex. 2 at 6.

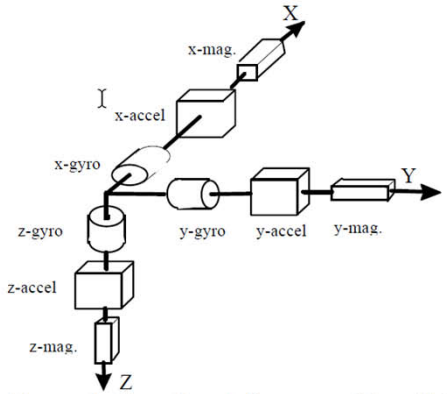

Figure 1: Functional diagram of InertiaCube

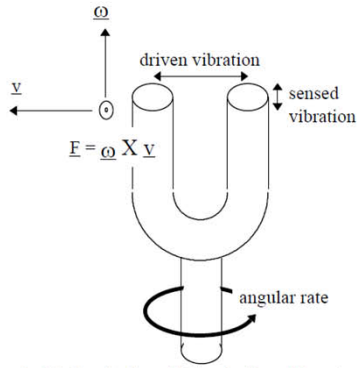

Figure 2: Principle of Coriolis vibratory gyroscope

Intersense IS-600 Ex. 2 at 7.

Exhibit A-16

CLAIM 59	InterSense IS-600

1.1.4 System Configuration

Figure 6 illustrates the configuration of the hybrid acoustic/inertial tracking system. The IS-600 hardware is essentially a superset of the IS-300 Series orientation tracking system, adding an ultrasonic range measurement system on top of the basic IS-300 Pro components. The drawing illustrates the IS-600 being used to track a helmet to which are attached an InertiaCube and two SoniDiscs. The rear SoniDisc has just received a trigger code matching its internal ID, and is in the process of emitting an omnidirectional acoustic pulse of 40 KHz energy. Only one SoniDisc is activated at a time.

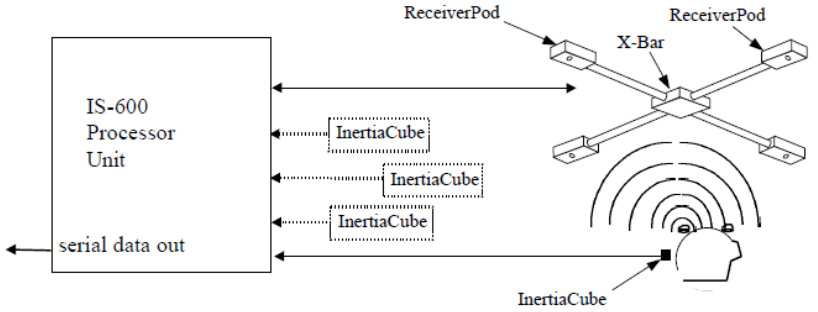

Figure 6: IS-600 HW diagram

The IS-600 has expansion capability up to 4 InertiaCubes and 8 SoniDiscs. Because these are packaged as separate modules, the user has the flexibility to configure the system for a very large variety of tracking tasks. The IS-600 also has several additional operating modes. These modes have different strengths and differing configuration requirements, as described in the following sections.

Intersense IS-600 Ex. 2 at 9.

Exhibit A-16

CLAIM 59	InterSense IS-600

Perceptual Enhancement Level

In order to provide the best performance for a large range of various applications, three levels of perceptual enhancement are available. None of the modes introduces any additional latency.

40

Mode 0 provides the best accuracy. The inertial tracker uses gyros to measure angular rotation rates for computing the sensor's orientation. To compensate for the gyroscopic drift, depending on the configuration, the tracker may use accelerometers, magnetometers or SoniDiscs to measure the actual physical orientation of the sensor. That data is then used to compute the necessary correction. In Mode 0 correction adjustments are made immediately, no jitter reduction algorithms are used. This results in somewhat jumpy output (not recommended for head tracking) but with lower RMS error. Use this mode for accuracy testing or for any application that requires best accuracy.

Mode 1 provides accuracy similar to that of mode 0, with an addition of a jitter reduction algorithm. This algorithm reduces the accuracy by only a small amount and does not add any latency to the measurements.

Mode 2 is recommended for use with HMD or other immersive applications. The drift correction adjustments are made smoothly and only while the sensor is moving, so as to be transparent to the user.

Intersense IS-600 Ex. 2 at 40–41.

See Disclosures with respect to Claim 58, *supra*; *see also* Defendants' Invalidity Contentions for further discussion.